

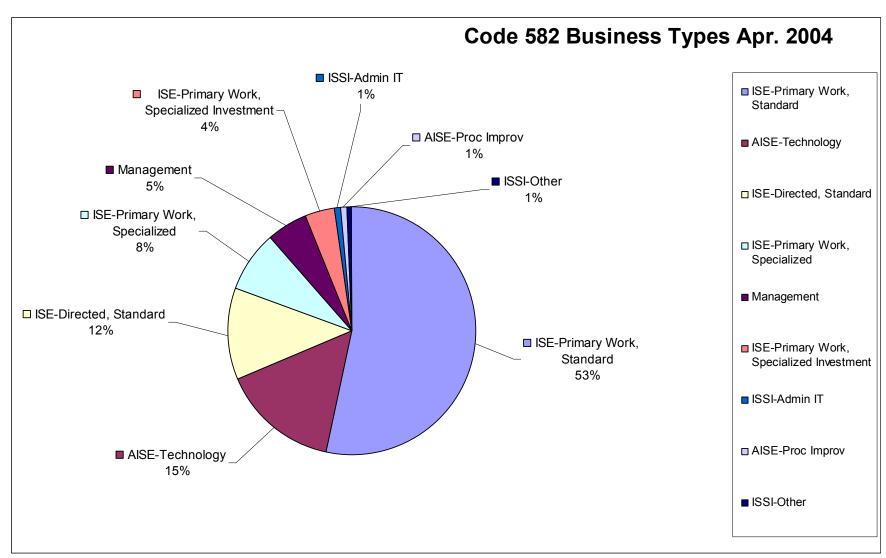
Flight Software Branch Code 582 Technical Status Review to ISD

April 27, 2004

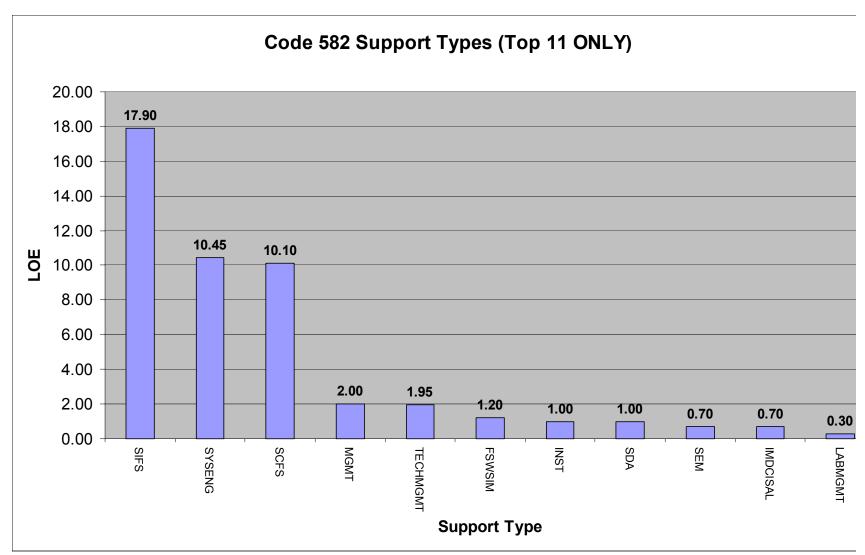
Elaine Shell, Branch Head Ray Whitley, Associate Branch Head Kequan Luu, Associate Branch Head Ron Zellar, Associate Branch Head



Code 582 Staffing Overview







	AISE Technologies	AISE Mission Request	Process Improvement
Michael Aguilar	(0.30)	1111411111	
Maureen. Bartho	0.50		
Dan Berry		1.00	
Mike Blau	(1.00)		
Leslye	(1.00)		
Tom Clement			0.30
Alan Cudmore			
Cindy Firman	0.10		0.30
Tina Fredo			0.40
Nancy Goodmar	0.50		
Stephe Leake	(0.40)		
Dave Leucht			0.20
Kequan	0.10		
Dave McComas	0.35		
Dwaine Molock	(0.30)		
Ken Rehm	(1.00)		
Susie Strege	0.80		
J-P Swinski	0.70	0.10	
Ray Whitely	0.10	0.10	
Jonathan Wilmot	0.70		
Ji-Wei Wu	1.00		
Ron Zellar		0.40	
Total Change	0.85	1.60	1.20



FSW DEVELOPMENTS

FSW Developments	Feb	Mar	Apr	ISD Review	cs	CS Chg.	SSC	Status
JWST ISIM FSW Development	G	G	G	Sep-01	3.0	0.0	16.0	FSW C8 delivered to BT (includes TMON). SIDU Requirements draft looks good. FSW SRR 4/28/04.
ST-5	G	G	G	Oct-02	2.5	-1.0	3.0	Pegasus XL launch vehicle confirmed for 12/05. New orbit and mission operations is expected to impact science processing FSW only. Budget reworked (no new costs); schedule reworked. Delivered Build 1.10 (inlcudes all reqmts. and known DCRs) for test.
Swift BAT	G	G	G	Jun-02	4.5	-0.5	3.0	Last planned BAT build going to S/C (BTs will continue in parallel). Includes fix for PCI bus lockup problem that was causing the watchdog resets. UG is 85% complete.
SDO	G	G	G	Apr-04	6.5	2.5	3.5	FSW Requirements near completion for all CPU. MAP & ST-5 reuse WTs active. SDN build 1 complete. FSW PDR preparations underway.
GPM	G	G	G		1.5	-1.0	2.0	Project is considering RSDO option. Budget and schddule reworked 2 ways: baseline and technology descope. Project has asked that FSW team "stay the course" for FSW PDR 9/04.
• FSW Devel. Staff Total	ıl				18.0	0.0	27.5	
Local FSW Devel. Task Oversight								
ST-7 DRS	G	G	G		0.0	0.0	~4	Supported FSW CDR 4/22.
HH SET	G	G	G		0.0	0.0	~2	New task in place. Dave Leucht COTR.



ON-ORBIT FSW MAINTENANCE

On-orbit FSW Maint.	and M	laint.	Prep	arations	;			
3rd FSW Maintenance	e/Dev	elope	er Ted	chnical E	xchan	ge4/29	/04.	
	Feb	Mar	Apr	ISD Review	cs	CS Chg.	SSC	Status
UARS, SAMPEX, RXTE, FAST, TRMM, TRACE, SWAS, WIRE, Terra, WMAP, Aqua, ICESat GLAS, Cassini CAPS & CIRS, SIRTF IRAC,	G	G	G	Sep-01	1.3	0.0	12.1	Much activity in support of Aqua Aura, Cassini CAPS and CIRS, GLAS, Terra, TRMM reentry, UARS, WIRE.
HST Payload	G	G	G		4	0.0	17.0	ACS: New positioning algorithm for filter wheel positioning uplinked and working as desired. STIS: Working s/w workaround for failed/slow lamp turn-on. NICMOS: Working fix to Intel exceptions which causes suspends. WFC3 build delivered. COS build planned.
• FSW Devel + Maint S	Staff 7	otal [23.3		56.6	



FSW SYSTEMS MANAGEMENT

FSW Systems Management	Feb	Mar	Apr	ISD Revie	CSs	CS Chg.	SSCs	Status
JWST ISIM FSW Mgmt.	G	G	G	Jun-01	2	0	1.5	Levels 3 and 4 FSW Requirements completed. 580/582 continue to cover this role.
JWST SSM	G	G	G		0	0	0.25	Minimal contractor support due to transition from Aura. Trying to hire Term for this pos.
Swift	Y	Y	Y	Nov-01	1	0	0	1st CPU 4/28-29, T/V 5/14, PSR 6/30, ship 7/7; L=9/1+. S/C & SI FSWs functionally ready for T/V. Ops. Sim. Tests going well. Maint. plan recommendations/risks in work. John Ong 'way overloaded' prioritized FDCs, I&T, CCB.
SDO	G	G	G	Apr-04	1	0	0	Major s/c systems engineering issues generated from FSW SRR are resolved. Working FSW PDR contents for 582 template purposes.
GPM	G	G	G		0.3	0	0	Some work on ICDs. Impacts to desired Science file contents identified.
EOS Aura	G	G	G		0.7	0	0.7	TES: patch tests were successful. Reqmts. verif. Artifacts are slow but coming. MLS: Tests of 5 reqmts. are an issue. HIRDLS: upload plans are under review.
NPP	G	G	G	Nov-01	1	0	0.5	IPO sensors are delayed forcing rethink of entire I&T flow to maintain 10/06 launch. S/C assembly moving forward at BATC. ICDs ok. Monthly WTs of S/C flight code by NASA and IV&V. Much planning w/NPOESS.
GLAST	G	G	G		0	0	2	Both S/C and LAT reviews supported by 582 ABH.
Sys. Mgmt. Staff	Total				6	0	4.95	



FSW Studies Status Summary

Flight Software Branch

Formal Studies	Feb	Mar	Apr	ISD Review	CSs	CS Chg.	SSCs	Status
IMDC	G	G	G		1.2	0.7		3 studies accomplished: MR2, 000, GEST
ISAL	G	G	G		0.9	0.4		2 studies accomplished: 000, LOLA
Total IMDC Mission	ns Su	pporte	ed:	50	since	e Apri	1200	1
Total ISAL Instrum				14				er 2003
Proposals	Feb	Mar	Apr	ISD Review	CSs	CS Chg.	SSCs	Status
GOES ABI instrum	ent				0.1			Brian Rehm on SEB (June)
000					0.1			Dan Berry has supported proposal development.
MAGNUS					0.1			Dan Berry provided Technical and Cost Estimate.
SAM								582 withdrew due to lack of customer support
MMS								J-P provided technical and cost estimate.
EPIC								Out-of-house instrument proposal supported by Brian Rehm. TMR at Hdqtrs. was encouraging.
LISA								no activity
Lunar Recon.								no activity yet
HST HRV								no activity yet



Branch Initiatives (1 of 3) FSW Advances

	Feb	Mar	Apr	ISD Review	cs	Chg. CS	SS C	
Core Flight Executive (cFE)	G	G	G		4.3	0.9	1	FSW requirements being reworked for consistency, then baseline. Some design/code is active.
OS Abstraction	G	G	G		1.2	1	1	Baseline OS Abstraction for SDNs complete. SBC capability is in work. Much internal enthusiasm.
cFE AP Plug and Play (GMSEC)	G	G	G		0.1		1	Late start. Message service complete. API definition for H&S in work.
FSW Reuse Library	G	G	G		0.1		0.5	Gforge server set-up is complete. Directory strategy and user interface being worked.
GN&C FSW Library elements	G	G	G		0.3	-0.2	0.2	Math utilities complete. Working library documentation
Dynamic Simulator Architecture (GDS)	G	G	G		1	0.5	1	Basic architecture is in place. Focus is interfaces for SDO SDNs.
Software-only Dynamic Simulator (GMSEC)	Υ	G	G		0.1	0	1	Late Start. Working to host MAP ACE into GDS as prototype.
MatLab Tools								On wish list. Need GN&C support.
Autonomous Orbit Maint.								GPM resource constraints on hold.



Branch Initiatives (2 of 3) FSW Advances

	Feb	Mar	Apr	ISD Review	cs	Chg. CS	SSC	
Onboard Network Services using Ethernet	G	G	G	Dec.03	0.2		0.8	2 Peer Reviews between 560 and 580 occurred. Good RFAs. Asynchronous Onboard IP/UDP services prototype complete 5/04.
CFDP	G	G	G		0.8			Flight prototype and implementation of CFDP using ASIST (584) is on schedule.
CCSDS SOIS	G	G	G		0.1		0.2	Spring meeting will be in Montreal.
RSat/MR2	Υ	Υ	Υ		0.1			Not clear what is wanted for August 2004 demo. Staff to deliver quick C&DH demo not available.
QMS Workshop Session Topics (GSFC and JPL)	G	G	G		0.5			582 leading 2 sessions: FSW Reuse will be discussed for 1.5 days. FSW Risks will be 1 day session.



Branch Initiatives (3 of 3) FSW Process Improvements

- Presented FSW Branch Process Improvement Initiative to the Branch Civil Servants. Plan is to present to contractors at ISD 'all-hands'.
- Sat down w/ Sally G. to itemize CMMI criteria against 582 SPI plans.
 Schedule for CMMI ratings is VERY OPTIMISTIC.
- Current focus is on:
 - FSW Test Plan and products based on use by JWST and SDO
 - FSW CM Plan, DCR process, metrics
 - FSW PDR Standard plan to use SDO FSW PDR as prototype
 - FSW Cost Estimation
 - FSW Maintenance Requirements on FSW Developments
 - FSW Risk Management Database (QMS w/s topic)

• Stats:

- 11 CCB meetings
- 39 actions assigned, 28 actions closed
- 71 DCRs submitted, 56 DCRs closed
- 27 products baselined (some w/ updates since baselining)
- FSW SPI Action Plan includes 113 additional products



Acronyms

ACS Advance Camera for Surveys (HST) ATMS Advance Technology Microwave Sounder (NPP) AXP Advanced X-ray Polarimeter BAT Burst Alert Telescope (Swift) Cassini CAPS Cassini CAPS Cassini CRS Configuration Compaste Inferer System CCB CCC Configuration Change Request CCC Configuration Change Request CCC Configuration Change Request CCC Configuration Change Request CRY Cosmic Origins Observatory CCC CCC Configuration Change Request CRY Cosmic Origins Observatory CCC CCC Configuration Change Request CCC Configuration Change Request CRY Cosmic Origins Observatory CCC CCC Configuration Change Request CCC CCC Configuration Change Request CRY Cosmic Origins Observatory CCC CCC Configuration Change Request CCC CCC Configuration Change Request CRY Cosmic Origins Observatory CCC CCC Configuration Change CRY Cosmic Origins Observatory CRAIT CREMS Cassini CRS Cassini CRS Cassini CRS Cassini CRS Configuration Control CRY CRY Compasted Cascine Casser Altimeter System (ICcSat) CRY CRY Cosmic Cry	-	mail Dianen			
FOT Final Qualification Test GLAS Geo-science Laser Altimeter System (IceSat) GLAST Gamma Ray Large Area Space Telescope GMSEC GSFC Mission Services Evolution Center GN&C Guidance, Navigation and Control GPM Global Precipitation Measurement HST Hubble Space Telescope IMDC Integrated Mission Design Center ISAL Instrument Synthesis and Analysis Lab ISIM Integrated Science Instrument Module (JWST) LANL Los Alamos National Laboratory LAT Large Area Telescope (GLAST) LISA Laser Interferometer Space Antenna WMAP Wilkinson Microwave Anisotropy Probe MASIS Monitor & Science Instrument Simulator (HST) MLA Mercury Laser Altimeter (Messenger) MR2 Modular, Reconfigurable, Rapid SI C&DH Science Instrument Command & Data Handling (HST) IRAC Infrared Array Camera (SIRTF) IRAC Infrared Array Reaction Wheel Science Instrument Synthesis Solar Array Science Instrument Mest Cymst SSU Sunport Services Module (HST & JWST) Space Technology 5 Space Technology 5 Space Technology 7 Space Technology 8 Space Technology 7 Space Technology 8 Space Technology 8 Space Technology 8 Space Te		ACS ATMS AXP BAT Cassini CAPS Cassini CIRS IC&DH CCB CCR COS CPU DCR DRS EPIC EOS	Advance Camera for Surveys (HST) Advance Technology Microwave Sounder (NPP) Advanced X-ray Polarimeter Burst Alert Telescope (Swift) Cassini Plasma Spectrometer Cassini Composite Infrared Spectrometer ISIM Command & Data Handling (JWST) Configuration Control Board Configuration Change Request Cosmic Origins Spectrograph (HST) Central Processing Unit Discrepancy Change Request Disturbance Reduction System (ST-7) ??? Earth Observing System	NIRCam JWST NPP OOO PSU SAMPEX RTEMS RTOS RXTE SAM SDO SEB SI	Spectrometer (HST) Near InfraRed Camera (JWST) James Web Space Telescope NPOES Preparatory Project Organic Origins Observatory Penn State University Solar Anomalous & Magnetospheric Particle Explorer Real-time Executive Multiprocessor System Real-time Operating System Rossi X-ray Timing Explorer Science Analysis at Mars Solar Dynamics Observatory Source Evaluation Board Science Instrument
ISIM Integrated Science Instrument Module (JWST) LANL Los Alamos National Laboratory LAT Large Area Telescope (GLAST) LISA Laser Interferometer Space Antenna WMAP Wilkinson Microwave Anisotropy Probe MASIS Monitor & Science Instrument Simulator (HST) MLA Mercury Laser Altimeter (Messenger) MLS Microwave Limb Sounder (Aura) MR2 Modular, Reconfigurable, Rapid ST-7 Space Technology 5 ST-7 Space Technology 5 ST-7 Space Technology 5 ST-7 Space Technology 7 STIS Space Technology 5 ST-7 Space Technology 5 ST-7 Space Technology 7 STIS Space Technology 7 ST-7 Space Technology 5 ST-7 Space Technology 7 State Technology 1 Space		ACS ATMS AXP BAT Cassini CAPS Cassini CIRS IC&DH CCB CCR COS CPU DCR DRS EPIC EOS EVE FKSI FQT GLAS GLAST GMSEC GPM HST IMDC	Advance Camera for Surveys (HST) Advance Technology Microwave Sounder (NPP) Advanced X-ray Polarimeter Burst Alert Telescope (Swift) Cassini Plasma Spectrometer Cassini Composite Infrared Spectrometer ISIM Command & Data Handling (JWST) Configuration Control Board Configuration Change Request Cosmic Origins Spectrograph (HST) Central Processing Unit Discrepancy Change Request Disturbance Reduction System (ST-7) ??? Earth Observing System EUV Variability Experiment (SDO) Fourier-Kelvin Stellar Interferometer Final Qualification Test Geo-science Laser Altimeter System (IceSat) Gamma Ray Large Area Space Telescope GSFC Mission Services Evolution Center Guidance, Navigation and Control Global Precipitation Measurement Hubble Space Telescope Integrated Mission Design Center	NIRCam JWST NPP OOO PSU SAMPEX RTEMS RTOS RXTE SAM SDO SEB SI SICADS SI C&DH IRAC RW SA SEU SITS SOIS	Spectrometer (HST) Near InfraRed Camera (JWST) James Web Space Telescope NPOES Preparatory Project Organic Origins Observatory Penn State University Solar Anomalous & Magnetospheric Particle Explorer Real-time Executive Multiprocessor System Real-time Operating System Rossi X-ray Timing Explorer Science Analysis at Mars Solar Dynamics Observatory Source Evaluation Board Science Instrument Science Instrument C&DH Simulator (HST) Science Instrument Command & Data Handling (HST) Infrared Array Camera (SIRTF) Reaction Wheel Solar Array Single Event Upset Science Instrument Test System (HST & JWST) Spacecraft Onboard Interfaces
MR2 Modular, Reconfigurable, Rapid WISE Wide-Field Infrared Explorer WISE Wide-Field Infrared Explorer		FQT GLAS GLAST GMSEC GN&C GPM HST IMDC ISAL ISIM LANL LAT LISA WMAP MASIS MLA	Final Qualification Test Geo-science Laser Altimeter System (IceSat) Gamma Ray Large Area Space Telescope GSFC Mission Services Evolution Center Guidance, Navigation and Control Global Precipitation Measurement Hubble Space Telescope Integrated Mission Design Center Instrument Synthesis and Analysis Lab Integrated Science Instrument Module (JWST) Los Alamos National Laboratory Large Area Telescope (GLAST) Laser Interferometer Space Antenna Wilkinson Microwave Anisotropy Probe Monitor & Science Instrument Simulator (HST) Mercury Laser Altimeter (Messenger)	SI C&DH IRAC RW SA SEU SITS SOIS SSM ST-5 ST-7 STIS SWAS TRACE TRMM UARS WFC3	Science Instrument Command & Data Handling (HST) Infrared Array Camera (SIRTF) Reaction Wheel Solar Array Single Event Upset Science Instrument Test System (HST & JWST) Spacecraft Onboard Interfaces Support Services Module (HST & JWST) Space Technology 5 Space Technology 7 Space Telescope Imaging Spectrograph (HST) Sub-millimeter Wave Astronomy Satellite Transition Region and Coronal Explorer Tropical Rainfall Measuring Mission Upper Atmosphere Research Satellite Wide Field Camera 3 (HST)
		MR2	Modular, Reconfigurable, Rapid	WISE	Wide-field InfraRed Survey Explorer